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| **Lesson Title:**  **Sea-Floor Spreading** |
| **Subject area / course / grade level: Science/ 5th grade** |
| **Introduction: Create a model of illustrate geologic processes responsible for changes in Earth’s crust** |
| **Lesson Length: 45 minutes** |
| **Materials: Two magic markers of different colors, two large sheets of paper, two desks that can be pushed together and pulled apart, computer for the websites, compass, magnet, and Elmo** |
| **Lesson Overview: This activity allows students to build a simple model of the sea-floor spreading along a mid-ocean ridge. This activity is most useful following a class discussion of where and why major mountain systems occur both on continental crust and oceanic crust.** |
| **Tennessee Standards: 5th Grade**  **0507.7.1 Create a model to illustrate geologic events responsible for changes in the earth’s crust.**  **SPI 0507.7.1 Describe internal forces such as volcanoes, earthquakes, faulting, and plate movements that are responsible for the earth’s major geological features such as mountains, valleys, etc.** |
| **Lesson objective(s): To help students understand the concept of captured magnetism directions on the sea floor that provides evidence of sea-floor spreading.** |
| **ENGAGEMENT**   1. Ask students to imagine they are in a deep submersible submarine, and to describe what they think the   ocean floor looks like. Is it flat, or are there any mountain ranges and valleys? Have them share with each other then as a whole class.  2) Show the students an actual map of the ocean floor. Tell them that the ocean floor is the last real unexplored  frontier on Earth.   1. Ask students if they see any “patterns” in the ocean floor topography. This is a good time to talk about how   the recognition of patterns in nature (i.e. observations about nature) is an important part of the process of  scientific discovery.  **Questions for the students to ask themselves:**  1) How does this model help explain the widening of the ocean basins?  2) What technology do geologists use to prove sea-floor spreading?  3) What features on the ocean floor does the model explain? |
| **EXPLORATION**  Have the students turn two desks so that they are facing each other and almost touching. Each student should  take a piece of paper and place them together in the slight gap between the desks as far down as  they can go while still having a grip on the paper. Have the students practice pulling both papers out of the desk at the same time and at the same rate of movement (this is the spreading ridge). The students should each  pull their own paper toward themselves, so that the effect is like the new crust forming and then  spreading out from the ridge. Once that is accomplished, each student should take a different colored marker. Start with a little bit of paper showing. Following your directions, both students very slowly pull the  paper out at the same rate, have one student color both pieces of paper along the ridge with one  marker, so that there is a strip of color parallel to the ridge. This color represents rocks that are  formed with their magnetic minerals facing toward a magnetic pole that is in the north (normal  polarity). When the magnetic pole has faded and then shifts to the south (reversed polarity), the second student should take the second colored marker and make the same type of strip of color. Have the students continue to change directions at your instruction. |
| **EXPLANATION**  Student explanations should precede introduction of terms or explanations by the teacher.  Show the Brain Pop video on the ocean floor and then go back to the pictures of the sea-floor. |
| **ELABORATION**  **The students/groups will build their own model of the sea-floor . Have the students study the amazing life creatures that are found in the mid-ocean ridges.** |
| **EVALUATION**  Through teacher observation and journaling/drawing about the different parts of the sea-floor in their science journals. |